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The Contribution of CIAT Genebank in the Development of High-Iron Bean Varieties and Farm-Level Impacts in Rwanda

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Genebanks play an essential role in a world where a substantial part of agricultural biodiversity has been lost from farming habitats, malnutrition persists as the global population continues to rise, and farm productivity is vulnerable to climate change. We demonstrate the importance of the genebank of the International Center for Tropical Agriculture (CIAT) in the development of seven iron-biofortified climbing bean varieties (CAB2, RWV3316, RWV3317, RWV3006, RWV2887, MAC44, MAC42) and the impact of their adoption on farm households in Rwanda. First, we link iron-biofortified climbing varieties directly to the genebank through pedigree analysis and key informant interviews with the breeders who developed them. Second, we apply an econometric model to test the impact of their adoption on the yield, consumption and purchase of beans by farming households in Rwanda. Analysis is based on a dataset collected from nearly 1400 households in 2015 by Harvest Plus. We find that the scope of the genetic diversity housed in the bean collection at CIAT was fundamental to developing successful iron-biofortified beans. In contrast to the findings of Vaiknoras (2019), which focused on a most extensively adopted variety of bush bean, we found no statistically significant effects. There could be various explanation for these results, such as the comparatively lower rate of adoption of climbing beans or their different characteristics and the difference in the way they are harvested. Our results suggest that it is possible to track the journey of an accession from its introduction in the genebank to its final use by farmers. Further research is needed to understand why these climbing varieties had less impact than the bush variety previously studied.

Keywords: Breeding, genebank, high-iron beans, malnutrition, Rwanda

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